From: "Liu, Jing \(ECY\)" <JLIU461@ECY.WA.GOV>
To: "Hale, Elly" <Hale.Elly@epa.gov>
Date: 11/16/2021 9:53:54 AM
Subject: RE: Additional cPAH analyses

Hi Elly,

Thanks for copying me on your email. Could you please forward me the memo from LDWG regarding their proposed additional cPAH analyses? Thanks!

Jing Liu
Toxics Cleanup Program
Northwest Regional Office
Washington State Department of Ecology

We have moved!

Starting May 26, Ecology's Northwest Regional Office has moved to Shoreline:

- Mailing address: PO Box 330316, Shoreline, WA 98133-9716
- Physical Address: 15700 Dayton Ave N., Shoreline, WA 98133-9716
- My new phone #: 206-594-0082
- 24-hour reception line: 206-594-0000

From: Hale, Elly <Hale.Elly@epa.gov>
Sent: Monday, November 15, 2021 6:22 PM
To: LDWEmails <ldwemails@anchorqea.com>; Susan McGroddy <SusanM@windwardenv.com>; Tom Wang (twang@anchorqea.com) <twang@anchorqea.com>; Amara Vandervort <amarav@windwardenv.com>; John LaPlante (jlaplante@anchorqea.com) <jlaplante@anchorqea.com>; Katy Gross <kgross@anchorqea.com>; Craig Hanson <CraigH@windwardenv.com>; allison.crowley@seattle.gov; afitzpatrick@geosyntec.com; Ben Starr <bstarr@geosyntec.com>; dave.schuchardt@seattle.gov; debra.williston@kingcounty.gov; florer.j@portseattle.org; jeff.stern@kingcounty.gov; Joe Flaherty - Boeing (Joseph.L.Flaherty@boeing.com) <Joseph.L.Flaherty@boeing.com>; bahnick.k@portseattle.org; kathyg@windwardenv.com; pete.rude@seattle.gov
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Subject: FW: Additional cPAH analyses

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From: Hale, Elly
Sent: Monday, November 15, 2021 6:21 PM
To: Kathy Godtfredsen (kathyg@windwardenv.com) <kathyg@windwardenv.com>
Subject: RE: Additional cPAH analyses

Hi, Kathy –

You asked for EPA concurrence on recommended archived Phase 2 samples for cPAH analysis, based on comparison to the ROD RALs, superseded by the recent ESD. EPA acknowledges that this work is being done voluntarily and EPA approval isn't required. I appreciate the opportunity to concur.

EPA review focused on the areas you identified, which have Phase 2 samples archived for cPAH analysis, recognizing that we are past PAH holding times for any archived Phase 1 samples. I understand that the cPAH data from these analyses and others will be presented in the Phase 1 and 2 Data Evaluation Report and addressed in remedial design submittals in a way that distinguishes this incremental effort. LDWG may collect Phase 3 pre-design samples for comparison to the ROD RAL for cPAHs as needed.

With this understanding, EPA concurs with the recommended samples listed in the table below, and we offer additional input for your consideration. For example, additional analyses of archived Phase 2 samples could be helpful in Area 34 and others, as described below.

Table 1. Phase II samples to be analyzed for cPAHs

RAL Exceedance Area (Phase I)	Phase II Location	Interval (Sample ID)	Rationale
32	677	0–60 cm (SC677)	re-occupying LDW-SC53 (2005) with a ROD RAL cPAH exceedance factor of 1.2 in the 0–60-cm interval
	678	0–10 cm (SS678)	re-occupying R-41 (1997) with a ROD RAL cPAH exceedance factor of 1.2 in the 0–10-cm interval
34	681	0–45 cm (IT681)	bounding subsurface to north of 379; note that SS681 had a cPAH TEQ of 94.4 µg/kg dw
	683	BCDEF (IT683BCDEF)	providing vertical extent information for remedy design in Area 34
	684	BCDEF (IT684BCDEF)	providing vertical extent information for remedy design in Area 34

cPAH – carcinogenic polycyclic aromatic hydrocarbon
dw – dry weight
ID – identification
RAL – remedial action level
ROD – Record of Decision
TEQ – toxic equivalent
TOC – total organic carbon

Existing data indicate cPAH levels at most locations in the upper reach are below the ROD RALs, with a few exceptions. Almost all of the exceptions exceed the ROD RAL by a factor of less than 3 and are at or near locations where concentrations of other COCs also exceed RALs. However, for design purposes, additional analyses now or future sampling may be helpful in bounding areas with cPAH ROD RAL exceedances in instances where they don't overlap with other COC exceedances.

- Current RAL Exceedance Area 34 (east of turning basin, discussed above) The analysis of all sampled intervals (10 samples) below 0-45 cm at the two vertical core locations #683 and #684 will help determine how deep the cPAH contamination goes, but these core locations don't coincide with #379, where cPAH concentrations are more than twice the ROD RAL in both the 0-10 and 0-45 cm samples. The nearest sample to the south with cPAH analytical results, #656, is below RALs but is 0-60 cm. Since it is not clear what might have led to the PAH levels seen at #379, where cPAHs are over twice the ROD RAL in the 0-10 and 0-45 cm samples, we recommend analyzing the 0-45 cm interval samples from both cores or at least from #683. This will support clearer bounding of what appears to be a small area (a scrap of treated wood? An old piling?). These samples could be analyzed instead of one or two of the deeper core interval samples.

- Area 32 - Head of Slip 6 (discussed above). There are previous core data from several cores (SB-01, SB-03, SB-04, and SC53) with concentrations of cPAHs greater than 1000 ug/kg BaP-eq. These data aren't for RAL intervals, the samples are mostly in subtidal recovery category 1 areas, they date back to 2004 (SB samples) or 2006 (SC53), and there has been sedimentation in Slip 6 since the 2003 bathymetric survey. Core SB-03 is in a recovery category 1 area and had 2000 ug/kg BaP-eq. It could be included in the RAL exceedance area, but #351 is nearly collocated and the 0-10 and 0-60 cm samples from 2020 were well below the ROD cPAH RALs. This area might warrant consideration for additional sampling during Phase 3, depending on the cPAH results of proposed analyses.

- Area 31 - Near Former Rhone Poulenc – The PCBs and D/F areas appear to encompass areas where intertidal sediment cPAH concentrations are over the ROD RAL of 900 ug/kg BaP-eq.

- Area 18 - Near Boeing/IT and Paccar – Area 18 has elevated cPAHs in at least one sample outside the Phase 1 DER RAL exceedance areas (REA). As design areas are defined, you may want to ensure that this is not overlooked. There are recovery category 1 subtidal areas west of the current REA 18 and the ENR intertidal pilot areas. While available data don't suggest high levels in these areas, the data should be reviewed as Phase 3 sampling locations and analyses are considered.

- Area 35 - SW of turning basin - Samples 383 and 384 from Phase 1 PDI had cPAHs > ROD RAL. I assume LDWG plans to address this area in design and will consider whether Phase 3 sampling for cPAHs is needed.

- Near Norfolk – One old sample (#207) had 1500 ug/kg BaP-eq in the top foot. Location #423 is very close by, but it appears the 0-60 cm sample wasn't tested for cPAHs. The 0-10 cm at location #423 is below RALs, at 546 ug/kg BaP-eq. The vertical core at Location 703x is archived and could be analyzed to ensure cPAHs are bounded.

Thank you. We are happy to discuss if you want clarification.

Elly

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From: Kathy Godtfredsen <KathyG@windwardenv.com>
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Subject: Additional cPAH analyses

Hi Elly – Please see attached for a brief memorandum detailing which additional Phase II samples are proposed for cPAH analysis. The attached mapfolio shows the locations for these samples.

Just let me know if you have any comments/concerns with these recommendations. When we reach concurrence, we

will get the analyses started in hopes of getting the data validated in time to include it in the draft DER.

Thanks!

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